

**MICHIGAN ENVIRONMENTAL SCIENCE BOARD
LEAD PANEL**

**MEETING SUMMARY
MONDAY, APRIL 11, 1994
PLANT AND SOIL SCIENCE BUILDING, ROOM A-271
MICHIGAN STATE UNIVERSITY
EAST LANSING, MICHIGAN**

PANEL MEMBERS PRESENT:

Dr. Jonathan Bulkley, Chair
Dr. David Long
Dr. George Wolff

PANEL MEMBERS ABSENT:

Dr. Raymond Demers

BOARD STAFF PRESENT:

Mr. Keith Harrison, MESB Executive Director
Mr. Jesse Harrold, Environmental Officer
Ms. Shirley Willis, Administration Officer
Mr. Alex Morese, Student Intern

I CALL TO ORDER

In the absence of the chair, Mr. Keith Harrison, Michigan Environmental Science Board (MESB) Executive Director, called the meeting of the MESB Lead Panel to order at 11:30 a.m. The chair joined the Panel at 11:45 a.m.

II EXECUTIVE DIRECTOR'S REPORT

Mr. Harrison reported that the next two meetings of the Lead Panel are scheduled for April 25th and May 2nd. At the April 25th meeting, Dr. Jerome Nriagu, University of Michigan; and Dr. Joel Pounds, Wayne State University, will speak. On May 2nd, Dr. Rolf Deininger, University of Michigan, and Dr. Joe Kilpatrick, a private consultant, will speak. Mr. Harrison indicated that the Panel had been provided with copies of a newspaper article concerning test kits for lead poisoning which can be obtained from the Ingham County Health Department; a compilation of the number of Public Act 307 sites which has lead listed as the contaminant; a copy of the Occupational Safety and Health regulations for lead; and a listing of the articles which have been transmitted to the Panel to date.

Dr. Jonathan Bulkley indicated that he had seen an article in the *Ann Arbor News* on an U.S. Environmental Protection Agency announcement to ban lead sinkers. He asked

that Mr. Harrison follow up on this. Dr. David Long stated that he had listened to an April 10, 1994 National Public Radio program on lead in the environment. He asked if Mr. Harrison would try to obtain a transcript from the program.

II PRESENTATIONS

Dr. Jaroslav J. Vostal, Environmental Health Assessment Consultants, presented background information on human impacts from lead contamination in the United States. A copy of Dr. Vostal's overhead materials is presented in Attachment 1.

Dr. Vostal said he was at the meeting to bring attention to how important it still is to prioritize and rank the individual routes of lead uptake in terms of human exposure. The first lead poisonings or exposures were brought to light in occupational medicine and organized research began in 1968. Beginning in about 1970 the emphasis changed from lead in ambient air from leaded gasoline and some point emissions, to exposures from indoor house paint. It also became clear that even low level exposures were dangerous. Since that time there has been a rapid decline in the number of lead poisonings due to controls for ambient air and the removal of lead from paint. However, there are other exposure routes. From soil, lead can enter plants and animals, influencing the presence of lead in both dust and food. Drinking water is another possible source. The federal Clean Air Science Advisory Committee in 1989 concluded that to accurately predict blood levels, all important exposure pathways must be considered, and that direct inhalation of airborne lead is a relatively minor pathway in children. Contaminated dust or soil is still the most hazardous exposure source for children and the most common pathway. The dust and soil are contaminated largely with old lead based paint.

Once ingested or inhaled, lead may behave differently in different individuals, depending on the presence of natural chelates in food, mobilization in the body, and other factors. In adults, 7% to 15% of lead that gets into the gastrointestinal system is absorbed. Of that, about 1.4% is ultimately retained. However, in children absorption accounts for more like 40% to 50 % and may go as high as 70% in early stages of development.

Mary VandenBosch, Michigan Department of Public Health (MDPH) Childhood Lead Poisoning Prevention and Control Program, asked whether it was true that some of the newer research indicates that under certain circumstances, such as calcium depletion during pregnancy, lead can leach back into the blood system from the bones. Dr. Vostal answered that early in literature on lead toxicity there was speculation that there were factors in the metabolism that could mobilize lead in the body, such as changing pH balance. However, those have been of little significance. Since the 1950s researchers have been trying to find a way to mobilize lead deposits from the skeleton, with little success until calcium ethylene diaminetetraacetic acid was found to be a useful chelate.

Dr. Long indicated that it was his understanding that the body can release massive amounts of accumulated lead over time as a result of body chemistry changes due to aging, resulting in a kind of self-poisoning. Dr. Vostal stated in his experience with occupational exposures, that that was not a significant factor. Workers suffering extreme exposures still have normal blood levels after a time, with most of the lead still stored in the skeleton. But there is a big difference between adults and children. The skeleton is being remodeled every day. Bone is reabsorbed and replaced by new bone. Some of the lead deposited in the bones could be expected to disappear slowly. In the child, the transition of the lead from blood to bone is much faster than the adult. Fortunately, children are also building skeleton faster.

Dr. Bulkley noted that in Europe, because lead paint is not used there, there has not been a problem with lead exposure. He asked whether leaded paint had been a problem in Canada. Dr. Vostal did not know the statistics on Canada. Dr. Bulkley then asked, given that most existing contamination is the result of lead based paint, what is the best way to clean up the contamination. Dr. Vostal replied that simply demolishing buildings or repainting surfaces to cover peeling paint, then replacing porous floors, results in safe levels, even when the ground around a building is contaminated. Tests after urban renewal showed that children had much safer levels of lead exposures, as compared to suburban levels, after these measures.

Robert Sills, Michigan Department of Natural Resources (MDNR) Surface Water Quality Division, made a presentation on lead levels found in various media in the environment. His presentation is summarized in Attachment 2.

Dr. Long asked if the sample collection methodology for the surface water data has remained the same since the beginning of the MDNR program. Mr. Sills stated that as far as he knew, there has not been a change in the manner in which the surface water samples had been collected. Dr. Long asked if MDNR used ultra-clean sampling techniques. Mr. Sills indicated that MDNR has not employed the use of such techniques. He continued by stating that this particular issue is becoming a major concern and that the validity of past tests for metals is being questioned.

Dr. Long noted that based on sediment cores that he has collected from Lakes Michigan, Ontario and Superior, lead, although still high, began to show a decrease around 1972, 1974. Sediment background has been around 20 mg/l. He indicated that because of the difference in sediment chemistry between the Great Lakes and the inland lakes, he would expect a difference in lead background. Background concentrations for lead are site specific depending on the sediment type. A large amount of silt or sand will result in lower levels of lead. In clay, the lead levels would be expected to be more around 20 mg/l.

Dr. Harold Humphrey, MDPH, asked about the apparent discrepancy between data presented by Mr. Sills, which indicated that lead sediment levels have been increasing over time, and the data from Dr. Long, which indicated that the levels have been decreasing. Mr. Sills indicated that if you compare the surface versus deeper sediment, the data show a higher elevation of lead in the more recent sediments. However, if you

look at the top most, undisturbed sediment and compare that with the sediment below, the data show that the lead levels have, in fact, been decreasing.

Deborah MacKenzie-Taylor, MDNR Waste Management Division, presented information regarding lead disposal in landfills, ambient lead levels in soils and the enforcement criteria as applied to soil lead levels. An outline of her presentation is presented in Attachment 3.

Dr. Long asked what type of medium is used in the lead leaching test. Ms. MacKenzie-Taylor answered that a solution of organic acetic acid is used. The test is supposed to be representative of the type of acid and pH which would normally be encountered in a municipal solid waste landfill. If the leachable level of lead exceeds 5 mg/l, it would be classified as a hazardous waste.

Dr. Long inquired if household hazardous wastes had any restrictions. Ms. MacKenzie-Taylor indicated that household hazardous wastes are not classified as a hazardous under Public Act 64 and can go to a Type II solid waste landfill. Dr. George Wolff asked if there was any concern about asbestos in a construction and demolition waste (a Type III) landfill. Ms. MacKenzie-Taylor responded that the only concern is the leachability of asbestos from the landfill into the ground water.

Ms. MacKenzie briefly described recent MDNR preliminary studies to look at roadway and urban park metal concentrations. Twenty-four samples were taken for the roadway study and were divided among freeway, city road and rural road sample sites. The study indicated that rural roads contained higher concentrations of metals. She indicated that these data must be approached with caution, however, because the rural road sites only accounted for 3 of the 24 sites sampled. The other study looked at urban parks in Lansing, Grand Rapids, Flint and Kalamazoo. The mean lead concentration of samples collected at the 0" to 2" depth was 53.9 mg/kg. At a depth of 4" to 6" the mean lead level was 42.0 mg/kg. Again, Ms. MacKenzie-Taylor recommended caution when looking at these preliminary data.

Dr. Long asked how MDNR implements the statewide default value for soil lead levels. Ms. MacKenzie-Taylor replied that the default value in terms of contaminated site clean ups may be used in lieu of conducting an expensive sampling program to establish the background for lead. Ms. MacKenzie-Taylor clarified that the default value for lead is for top soil and clay. Dr. Long observed that the 21 mg/kg for lead in the soil covered most of state. Mr. Harrold (MESB) asked if soil pH was considered when the baseline soil analysis was done. Ms. MacKenzie-Taylor answered no.

Mary A. VandenBosch, MDPH, gave a presentation on the Michigan Childhood Lead Poisoning Prevention and Control Program. The program, funded by Centers for Disease Control (CDC), collaborates with an advisory committee, a medical management committee, an interagency resource group, several subcommittees, and several other agencies across the state to address the lead problem in Michigan.

Ms. VandenBosch stated that the CDC has lowered sensitivity blood lead levels to 10 mg/dl and prohibited screening administered with a finger stick because it is not a direct lead test. In June 1993, MDPH installed new analytical instruments that are sensitive to a level of 2 mg/dl, and changed its method to screen for lead. The program is presently working on developing a more sophisticated system to track data. The Michigan Childhood Lead Poisoning Prevention and Control Program has established 4 pilot agencies that compile specific data through lead poison screening. Data are also collected from the Early Periodic Screening Diagnosis & Treatment comprehensive screening program, local health departments, and private medical service providers. Most of the areas have only screened about 2% of their target population. Approximately 19,000 children have been screened through the pilot agencies so far, and approximately 8% have been found to have blood lead levels of greater than 10 mg/dl.

Dr. Bulkley asked what constituted the target population. Ms. VandenBosch stated that the CDC target population is 0 to 6 years old, and children at that age group are probably at the highest risk. Screening generally begin at 9 months old, however, high risk children are screened at as early as 6 months. By CDC rules, children at a level of 20 mg/dl would require a medical examination; an environmental health investigation to try to determine the lead source; and a home visit by a public health nurse who would help educate the family on lead sources. The chelation process is used at the level of 45 mg/dl, and that the purpose of chelating is to accelerate the removal of lead from the body.

Dr. Bulkley asked what happens to children with blood lead levels between 20 mg/dl and 45 mg/dl; and when chelation is not administered, can the delay in removal of lead from the body cause neurological damage. Ms. VandenBosch responded that the program is set up for preventative measures; that is, to find the source of lead and eliminate it from the child's environment. For children with lead levels between 10 mg/dl and 45 mg/dl, it is important to find the source of lead and eliminate it so that the level can go down to normal. These children in the meantime, go through the process of the environmental investigation, the nurse home visitation, and physician care. The United States Food and Drug Administration does not recommend chelation for at blood lead levels less than 45 mg/dl.

Dr. Long asked if rural families are involved in the screening; and if there are any data regarding children who are around farm machinery that may use lead gasoline. Ms. VandenBosch said that Muskegon is the sample rural area representative; however, the screening is not limited to that area only. She pointed out that leaded gas is used for farm equipment and other sources such as small planes that dust crops. She also pointed out that new sources of lead are being found, for example, in folk medicines that are used by some cultures. Mr. Harrison asked if any data have been generated regarding lead poisoning in folk medicines. Ms. VandenBosch answered that there are only a few instances in the state.

Dr. Humphrey (MDPH) asked if, taking into consideration all of the routes or sources identified, lead house paint was still the predominant source. Ms. VandenBosch replied yes, but in children it is cumulative. While children might be getting some from the lead based paint in the house, they could also be getting lead from water, soil or other routes. Dr. Long commented on a National Radio Report that spoke about lead contamination from paint chipped window sills the significance of high levels of ingestion. Ms. VandenBosch indicated that some studies have been done on the amount of ingestion and the length of time it would take to be lead poisoned; however, it is difficult to make blanket statement regarding the amount of lead it would take to become lead poisoned.

PUBLIC COMMENT AND QUESTIONS

There were no comments or questions from the public.

NEXT MEETING DATES

The next meeting dates for the Panel are Monday, April 25, 1994, 1:30 p.m. and Monday, May 2, 1994 at 1:00 p.m.. Both meetings will take place at Michigan State University.

ADJOURNMENT

The meeting was adjourned at 2:45 p.m.

Keith G. Harrison, M.A., R.S., Cert. Ecol.
Executive director
Michigan Environmental Science Board